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COMMISSION

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BAY BRIDGE DESIGN TASK FORCE
Wednesday, April 23, 1997, 4:30 p.m.
Suisun City City Hall
City Council Chambers
701 Civic Center Blvd.
Suisun City, CA

Chairperson: Mary King
Members: Sharon Brown
Mark DeSaulnier
Elihu Harris
Tom Hsieh
Jon Rubin
Angelo Siracusa
Staff Liaison: Steve Heminger

AGENDA

1. Welcome, introduction of MTC Task and review of public participation process -- Mary King, MTC
2. Welcome, introduction of Solano County Transportation Authority --Jim Spering, MTC
3. Presentation by Caltrans -- Denis Mulligan/Brian Maroney
   - Video presentation on bridge design alternatives
4. Other Business/Public Comment

Public Comment: The public is encouraged to comment on agenda items at committee meetings by completing a request-to-speak card (available from staff) and passing it to the committee secretary or chairperson. Public comment may be limited by any of the procedures set forth in Section 3.09 of MTC's Procedures Manual (Resolution No. 1058, Revised) if, in the chair's judgment, it is necessary to maintain the orderly flow of business.
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(COMM/BAY BRIDGE/AGENDA)

Bay Bridge Design Task Force
Public Hearing
April 23, 1997 - 4:30 p.m.

Public Sign-in Sheet

NAME	REPRESENTING	ADDRESS
1. Don Erickson	Solano Transportation Authority	875 Woodlake Dr Davis CA
2. Martin Tuttle	Solano Trans. Authority	
3. Surlene Grant	Public Affairs Mgmt.	
4. Neal Liddicoat	Korve Engineering	455 Capitol Mall #703 Sacramento, 95814
5. Patrick FLynn	HDR Engineering	505 14th St Ste 940 Oakland, Ca.
6. Sally Bull	Harding Lawson Assoc	90 Digital Dr Novato, CA 94949
7. Steve Dennis	STA	
8. Hsueh, Chen-tung	Consultant Professor	c/o Project engineer STA EQE, international
9. W. David Liu	IAI	9912 Business Park Drive Suite 130 Sacto CA 95827
10. John Schreibe	VACAVILLE RENAISSA	

Bay Bridge Design Task Force
Public Hearing
April 23, 1997 - 4:30 p.m.

Public Sign-in Sheet

NAME	REPRESENTING	ADDRESS
1. STEVE VAN PELT		272 OAKHURST PL MENLO PARK, CA 94025
2.		
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PRESS
Bay Bridge Design Task Force
Solano County
April 23, 1997 - 4:30 p.m.

NAME	REPRESENTING
1. Charles Swan	Daily Republic
2. A - Astaneh-Asl	~~FC Be~~ "Astaneh-Black" Bridge design
3. G. Black	"Astaneh-Black" Bridge Design
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The San Francisco - Oakland Bay Bridge
A Modest Proposal
by
M.T. Brink

If not a modern replacement identical or at least similar in appearance to the original, here is another approach to the Bay Bridge debate which could help shed some light.

What do we have here? A (never again) large man-made landfill island in the middle of the Bay, connected to San Francisco to the west by the greatest four tower suspension bridge in the world, but with only one very unsafe lane of vehicular access.

To the east of Yerba Buena, the now beautifully lit Art Deco erector set necklace of a formerly most functional double deck rail and auto causeway.

Proposal:

1. Construct a new ten/fifteen lane wide causeway north or south of the existing structure.

2. Remove the entire upper and lower decks of the old East -Bay half of the Bay Bridge.

3. Take ultra light open-air streetcars from the East Bay on the now single deck old bridge to a more or less correctly restored 1939 Treasure Island. No roadway beneath the rails, only a couple lanes of traffic, and from the outer railing inward on both sides; bench, sidewalk, skating and bicycle lanes. The old bridge could prove to be a quite savable Atlantic City or Santa Monica pier-like light-rail, pedestrian, roller-skating and bicycle promenade extending from the East-Bay waterfront all the way to Treasure Island. San Francisco bound bicycle commuters from the East-Bay could take Treasure Island-San Francisco ferries for the final leg if access to the western spans of the Bay Bridge is impossible.

4. In the middle of the original Treasure Island Airfield (never constructed); a giant, multi-use Art Deco stadium for your Giants, 49ers, Olympics... whatever. (Sink it deep enough and they will come). Or maybe just music...

Keeping open pedestrian, bicycle, and light-rail access throughout could in no possible way be seen to impede any other development.

Michael T. Brink
4970 Ranch Rd.
Tiburon, CA. 94920
(415)789-9768

METROPOLITAN TRANSPORTATION COMMISSION

SAN FRANCISCO-OAKLAND BAY BRIDGE DESIGN TASK FORCE

PUBLIC MEETING

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SUISUN, CALIFORNIA

APRIL 23, 1997

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METROPOLITAN TRANSPORTATION COMMISSION

SAN FRANCISCO-OAKLAND BAY BRIDGE DESIGN TASK FORCE

PUBLIC MEETING

— — —

San Francisco-Oakland Bay Bridge Design Task Force public hearing, held at Suisun Civic Center Auditorium, 701 Civic Center Drive, Suisun, California, commencing at 4:30 p.m., Wednesday, April 23, 1997, before Sharon Lancaster, CSR No. 5468.

A P P E A R A N C E S

TASK FORCE PANEL:	REPRESENTING:
MARY KING (Chair)	ALAMEDA COUNTY
JAMES SPERING	MTC, CHAIRMAN
SHARON BROWN	CITIES OF CONTRA COSTA COUNTY
DORENE GIACOPINI	MTC
TOM HSIEH	SAN FRANCISCO COUNTY
JON RUBIN	CITY OF SAN FRANCISCO
ANGELO SIRACUSA	BCDC
BRIAN MARONEY	CALTRANS
DENNIS MULLIGAN	CALTRANS
WILL TRAVIS	BCDC

I N D E X

WEDNESDAY, APRIL 23, 1997, SUISUN, CALIFORNIA

4:30 P.M.

- - -

CHAIRPERSON KING: I would like to call the meeting to order. We are here to review the design of the retrofit of the Bay Bridge.

I would like to introduce at this time my colleague and our host, Jim Spering. Jim is also the chairman of the MTC, and it is through the auspices of his good office that we convene to hear public testimony with regard to how you would like to see this bridge look and work. And I appreciate being in Suisun City. Now I'll turn it over to Jim.

MR. SPERING: Mary, thank you very much.

I want to welcome the Commission and the Task Force to Suisun City and to Solano County.

As you know, our residents of Solano County have a very keen interest in this project. Most of our residents and commuters have to go across two bridges, and so we're very sensitive to the cost of the tolls.

I also would like to welcome Caltrans, Dennis Mulligan, and his staff. Dennis is becoming a bridge expert in California. We're dealing with him on the Carquinez and also on the

Bay Bridge.

CHAIRPERSON KING: Thank you, Mr. Spering.

I would like to start to my right, to my far right, and welcome the members of this committee and thank them all for being with us. Many of them have traveled from a long way. I know Angelo Siracusa must have decided to come to the meeting that was furthest from his home. So this committee is committed.

I will start to my far right.

MS. GIACOPINI: Dorene Giacopini.

MS. BROWN: Sharon Brown, Contra Costa.

MR. HSIEH: Tom Hsieh, San Francisco.

MR. RUBIN: Jon Rubin, San Francisco.

MR. SIRACUSA: Angelo Siracusa, BCDC delegate to MTC.

CHAIRPERSON KING: The purpose of our task force is twofold. First, it is to develop a consensus recommendation on a design option for a new eastern span of the Bay Bridge. Caltrans has proposed at this point three design options.

Their initial proposals were for a skyway, viaduct and a double tower cable-stay bridge. In the past two weeks, they have brought forth a design for a single tower cable-stay bridge.

And they are now at work on a fourth design, an arch bridge, which they describe as a modification of the viaduct concept.

Caltrans has also indicated they are willing to consider additional options provided they meet the strict engineering and design criteria required for this critical project.

I also want to thank Caltrans at this time. Because I did get questions on whether or not this is real or is this just a show, and I think the truth of the matter is that Caltrans has been true to their word, in their willingness to expand upon the work that they did prior to this committee convening, by the ideas that have been brought forward by the public. And I thank you very much for doing so.

This afternoon Caltrans will review with us the design alternatives they have proposed. All design options will be evaluated by a team of cost reviewers, engineers, seismic specialists and design experts that are shown as the first three steps on the large timetable to your right, that is to my left and your right. And you can review that, and you can look at our schedule.

The second purpose of the task force

is to recommend any additional features that might be included as a part of the bridge project. Let me be clear that what should be considered additional features or extras, as they have been described, and what should not.

MTC does not believe that having two standard shoulders on the new bridge is an extra. We also do not believe that additional seismic retrofit to the existing west span, so that it is as strong as the new east span, is an extra. MTC believes both of these items should be included in the base cost of the new bridge.

This base cost will be used to determine the cost-sharing arrangement that is currently being negotiated between our legislators and others in Sacramento.

We do acknowledge that certain additional features such as cable towers, bike lanes, other design elements may be desired by the Bay Area community and that the cost of these additional features may not be borne by the state.

I think it's also important to emphasize that the best bridge design may not necessarily be the most expensive one.

The timetable shows, as you have

looked at it, that the engineering and design review experts are scheduled to complete their work in June, culminating in a report to this task force. The MTC task force will then have another two months to complete its deliberations by the end of July.

We appreciate those of you who are joining us today, some for the third or fourth time, and some for the first, having taken your time to give us the benefit of your advice and opinions on the design of the new bridge. Obviously, hearing from as many people as possible is critical to the work of the task force, and we certainly welcome and appreciate comments.

This is the third public meeting following earlier ones which were held in Alameda and Contra Costa County. And our fourth meeting will be held in San Francisco on Wednesday, May 8th, for which the time and place are listed on the facts sheet, which you can pick up in the back of the room.

We've established three other ways for the public to comment on the bridge design. We have a telephone comment line. That's also available to you in the back. You can reach us through the internet. Talk to other people about

doing that, that might not be able to make these meetings. Or you can mail written correspondence to me, at an address that is also listed in the back of the room.

This process is incredibly important. We are giving ourselves a very aggressive timetable to reach some community consensus. We realize the significance of doing so is about health and safety in this area. The current bridge needs to be retrofit or replaced in order to make sure that all of us, our children and our grandchildren, are safe on that trip, and that's of primary importance.

So we're going to move as quickly as possible. We are going to allow the time for public participation. But we really do intend, on this committee, to stick to our commitment in terms of time frame, and we would appreciate your doing so.

So those who have comments or know others who do, please come forward during the time that is afforded, because I'm not going to be particularly sensitive to those who don't make the most of this opportunity, since the public safety is a responsibility for all of us who serve on MTC.

And I want to thank BCDC for their participation. The executive director is here

present, as he has been in the past.

And I want to thank the design and engineering group. They met yesterday, so they are probably not here. But they are working hard on a similar track to our own.

Now I would like to once again call upon Jim Spering to introduce the Solano County Transporation Authority, whoever may be present.

MR. SPERING: Thank you, Mary. Our Chairman, Steve Lesser, Councilman Steve Lesser, is here with us. We also have Don Erickson, representing the City of Dixon. I think those are the only two I see. And our executive director, Marty Tuttle.

CHAIRPERSON KING: Thank you for joining us.

Before we proceed, I would like to ask the members of the committee if any of them have a statement they would like to make.

MR. HSIEH: Madame Chair, I pay special attention to this particular hearing because the people here are representing the far end of the east span of this Bay Bridge, and I believe that their input will be important because not only will they travel through the Bay Bridge, but they also have to

travel through another bridge.

So everything we're doing here, while we consider the aesthetics, the design, the seismic safety issue, we also have to look at the amount of money that is required to carry the entire cost for the people who are eventually going to be using it.

So I'd like to acknowledge your importance, and the significance of this session today.

CHAIRPERSON KING: Mr. Travis, do you have any comments?

MR. TRAVIS: I do not. Thank you.

CHAIRPERSON KING: Then we will move on to presentation from Dennis Mulligan and Brian Maroney. We're not going to hear from them. I'll give you their titles. They are from Caltrans. And Dennis is the deputy district director, and Brian is the project engineer. They will show us a video on three of the bridges and alternatives that they've studied to date.

Before we continue with this, I would like to remind speakers to please fill out a request to speak form that is available at the table in the back and hand that back to one of the MTC staff persons. And if you will print your name clearly, I

will try to read it appropriately when you come forward to speak.

MR. MULLIGAN: Thank you, Madame Chair.

Tonight, actually, we have four proposals to share with you.

VIDEO PRESENTATION BY DENNIS MULLIGAN

(Videotape viewed.)

MR. MULLIGAN: Thank you, Madame Chair. I just want to make one comment. There was various members included in the presentation. We have a handout in the back, so if people did not get all those members, they can pick up a handout on their way out and can read that at their convenience.

CHAIRPERSON KING: Thank you.

Well, it's now your turn. I would ask, because this meeting is being recorded, that you state your name as you come to the mike, restate it, and if you have a difficult name to spell, please spell it so the court reporter can take it down.

The first speaker is Professor Astaneh. He's been at all of our meetings. And I'm delighted to see you here. Sorry I wasn't able to

make your conference on Saturday, but I saw the excellent press reports. Thank you again for being with us.

STATEMENT BY HASSAN ASTANEH

PROFESSOR ASTANEH: Thank you, Madame Chairperson. It's an honor for us to be involved in this process. This was inspired by your group; we start this because of your group. And I remember the first time I had come to the meeting and felt that we, as faculty and residents of the Bay Area, have a responsibility to do whatever we can to participate in this extremely important project. And I would like to invite my colleague and teammate, Professor Black, to join me.

My name is, for the record, A-b-o-l-h-a-s-s-a-n. Last name is A-s-t-a-n-e-h. And it's the Astaneh-Black bridge team.

Professor Black.

PROFESSOR BLACK: Yes. Hi. It's Gary Black, from the Department of Architecture. Thank you.

PROFESSOR ASTANEH: What we are going to do is, first Professor Black is going to show you the architectural aspects and introduce you to our

design. And then I'll come back and I will show you some seismic aspects and design and behavior aspects of it.

And since, Madame Chair, you mentioned that you missed our presentation, certainly you have this much, but it will be recorded professionally on tape. And we are already making copies for members of your committee, and we will be sending those on Friday. And, hopefully, early next week you will receive it. And we would be very happy to send those tapes to others, also. Please feel free to let me know where to send them, to make sure you receive a copy. And now, Mr. Black.

STATEMENT BY DENNIS BLACK

PROFESSOR BLACK: I would like to just say that, of course, the main issues we're addressing here are seismic safety and cost. I very much like what Madame Chairman has said, that she doesn't believe that a striking and good design needs to be more costly. And we concur completely with that.

But we have also -- in the same time that we're dealing with seismic issues, very serious

ones, and cost issues, very serious ones, we're also very concerned about the East Bay span and how that appears. I would just say, you know, those of you who drive that thing every day, you know, you go across the Oakland East Bay span and then you go through the tunnel. And you come out of that tunnel, and suddenly there you are on this beautiful suspension bridge, and there is San Francisco staring right in front of you.

We want to have the same thing happen to people who are going the other direction. You come through to tunnel, and you come out of the tunnel into the daylight, and there is this beautiful bridge there, and Oakland standing in front you.

(Overhead slides viewed.)

And what we have conceived here is basically a bridge that is curved in plan. It is hung from a single tower that is rooted in the solid rock at the tip of Yerba Buena. The tower leans away from the deck; not for some aesthetic design reason, but because that is the thrusting that the cables need to have bring the forces along the bridge and to stabilize the whole structure.

In plan, as I say, it looks like

this. It didn't show up very well in the newspaper articles. So there you can see Yerba Buena, and you can see the cables. So there is the tip of Yerba Buena and the water, of course. It's about 1500 feet from the tower.

This is a motorist approach heading west, and the other approach as you head west.

And now I'd like to turn it back over to Professor Astaneh, who will just describe very briefly some of the preliminary structural analysis.

PROFESSOR ASTANEH: Madame Chair, are we okay on time?

CHAIRPERSON KING: We're fine.

STATEMENT BY HASSAN ASTANEH (RESUMED)

PROFESSOR ASTANEH: I'm going to talk about our proposal as far as structural engineering and earthquake engineering aspects of it.

Every time you have a project of this magnitude, when you have a structure of this magnitude, what you have to do is, the first thing is, it has to be cite specific. There is no bridge of this magnitude in the world, that you can find, that is just looking like any other bridge,

structurally. Of course, architecturally, Professor Black explained the whole reason of this thing. But structurally.

So each bridge, if you look at it, major bridges, they are not coming out of the mud. They are coming out of really site specific concentration.

In order to start any project like this, you have to look at soil. You have to really see where you are putting your footing. Otherwise, you may end up putting your tower in this hole, 600 feet soil, on the bay side, and you may end up having very, very costly bridge.

In our case, having worked on the Bay Bridge for six years for Caltrans, we really appreciate the kind of funding and support we get from Caltrans. We did a number of projects with, certainly, Dr. Brian Maroney and others, who were involved with us. I told them, I have got to know what soil and rock there is.

And I found out, over these years, that there is a certain place in the Yerba Buena Island that you can put your tower. One item is rock, but it is not a solid rock. There are a lot fissures and cracks around the island, that you

don't want to put your tower on those cracked parts. So it turns out that our design really ends up having the tower at the best solid part of the island.

This is a cross-section. The tower that we have now sits on the flat land behind the small hill that is here. And that is useless. So anything on the east side of that hill is useless rock. It is behind that little hill. And that area is almost flat rock, very solid.

So far, with the geological information that we have collected for six or seven years, we don't have any problem with that area. And the important thing in that area is that the area is so high, that our foundation is dry foundation. So when you excavate it, it is not going to go below the water.

This slide doesn't show that. But our dimensions show that the foundation will be above water level, the bottom of the foundation. That's one important item.

What I'm going to show here -- please don't be alarmed at all the colors and lines. In order to study our own bridge and analyze it, we also took a straight bridge, similar to straight

bridges that are built in the world, in order to have some idea what is the difference between straight bridge and our curved and sloped tower bridge.

These colors show the stresses due to just the weight of the bridge, and each color represents a certain amount of stress. What it tells you is that stress really is a lot of variation on this bridge, and under gravity, we have a lot of stressed areas.

This is a straight bridge under dynamic forces of seismic event. What happens in a straight bridge is that these straight bridges end up having a lot of torsional behavior in the deck, so the whole area of the deck twists. And that is not desirable.

So understanding those, we move into our bridge. In our bridge, you see only two colors here. Part of these are for temperature, part of them are stresses due to weight. What it means is that, really, we have almost captured zero stress. Yellow is almost zero. That's slightly above average amount of stress.

So our deck, during either temperature or gravity load, which is the service

condition, we'll have very small stress on the deck. So it is ready for seismic. And because this is like a tripod, our bridge deck sits on this pier here, this pier here, and this pier, the whole bridge makes a triangular tripod. For that reason, it is three-dimensional, so it does not have torsion.

Whereas, any straight bridge you look at, it's like a line, it's like a rope, and those lines end up having a lot of torsional disadvantage.

Now, this is our bridge under an earthquake. You might have read the article that the Chronicle had on our bridge, that it's like a bird. I would like to explain that, what it means.

This is the only bridge that we have seen that motion of tower and motion of deck is not synchronized. What it means is this. Let me explain it to you.

This tower, because of being sloped, when the deck goes down like this -- of course exaggerated -- this is very, very much exaggerated -- but when these two parts of deck go down during the quake, in ordinary bridge the tower also goes down with them, bends down. So you have a synchronized motion of the deck going down, and the tower bends

with it. So deck and tower going to the east and deck and tower going to the west.

In our bridge, because of this contractional arch and tower, when the deck goes down, the tower goes up. So it pulls it down. When the deck goes up, the tower head comes down.

So I kind of looked at comparison between the flight of a bird. If you have seen storks flying, when they flap their wings, when the wing is going down, in order to balance the momentum, they put their head back. When the wings go up, they put their head forward. That is to balance the momentum and use the least energy. Those animals have evolved millions of years, and they know how to balance their energy.

We found, actually -- this is not something that we designed -- we found that this bridge actually does it. So we are very pleased with the seismic behavior, that because of that tower going against the deck, if the deck is going down, tower is going this way up, so it pulls the deck up. When the deck is going up, the tower comes forward and releases it. So the vibrations are very, very small.

I wish we had a videotape player

here. I could show you the animation of this motion, and you could see much better. But the tape that I'm going to send you, if you don't have time, if you just run to the last five minutes of it, you can see the animation of these bridges and you can see that motion that I was talking about.

What we have done is, basically, we have tried to put the bridge there. But as you can see -- as Professor Black said, we want to make the East Bay Bridge, you can put on your postcard. If you picked up the color folder that we put outside, we really feel that, what with having all this discussion of Olympics coming here, we are hoping that this bridge will be built. We are sure that it is safe. It's going to be safe when we finish our design. Conceptually we have shown that it is going to be safe.

On May 12th and 13th and 14th, we are going to technically, and in detail, produce information to the technical committee to show and answer their questions, and, of course anticipate to show that actually this bridge is, of course, seismically safe. It doesn't matter how beautiful it is; it has to be seismically safe.

We are going to show it's

economically doable for the cost of one billion dollars, we hope. And we are hoping that this bridge will be chosen as the bridge that will be built for the East Bay. I really appreciate the time that you have provided us.

CHAIRPERSON KING: Thank you.

MR. RUBIN: Obviously, this is a captivating design and very attractive presentation. I can't wait to see the animation. I'm sure it's incredible.

The question I have, as a layman, virtually no engineering experience at all, or knowledge, is simply that wish I would bring to find you by the first model of a very futuristic new car, you know. How -- and I'm not expecting you to do it today. But I think the question that will be asked is, how? Being as this is the first, that I know of -- there is no other bridge like this in the world, is there?

PROFESSOR BLACK: No. Let me try to answer that.

Of course, in modern engineering there are a number of bay size layers, a lot of high technical things that you hear about, that modern bridges are designed with. And, you know, those

things are sitting up there. There is even some debate about how well they really work.

So one of the things we set out in the very beginning was that the bridge should be fundamentally sound and safe, without a lot of bells and whistles and gizmos on the thing. And I built early on, Mr. Astaneh and I, built a physical model of the bridge. And you can tell a lot from the physical model, in some sense more than you can from a computer model. So you have that thing, and you can push on it, and you can distort it this way and see what happens.

That bridge has a very safe feature which engineers refer to, something called "restoring forces." So that as you displace the one direction and you stand back and don't touch it -- like a trainer airplane. You know, a trainer airplane, basically the pilot -- they'll tell you, if you get into trouble, take your hands off the controls and the plane will stabilize itself.

So this bridge has self-restoring forces that bring it back into equilibrium. So on the one hand, while it might look very futuristic, it has very sound, basic structural performance inherent in the design.

MR. RUBIN: It seems like a very elegant design, very seductive and elegant. It's a mixture of form and function which is both engineering and aesthetically amazing.

PROFESSOR ASTANEH: I just want to -- structurally -- we have been working on this bridge for a month and a half. And this last Monday morning was the first time that, after going through full-time weekend analysis that I did myself, that was the time I realized how elegant this structure performance is. I just can use the word "elegance."

It's the basic static of gravity that really is working for you, and you can't lose that gravity force in any earthquake. In other words, when earthquake hits this bridge, the gravity force is actually not hurting you. It restores that bridge to its original position.

So I was personally -- may I use the right word, "surprised." I was surprised at the structural performance, how well balanced the structural performance of the bridge is. Of course, we come from the first initial vision that Professor Black had with our picture; we planned to get it to make it work. But the main feature is there architecturally. And structurally, now it works

well.

So we believe that we are able to show -- of course, in the time that we have, we haven't worked on this bridge for months. And budget-wise, it would be better to leave it at that. We certainly didn't accept any sponsorship. We want to do it just on our own. In having a lot of bright students to help us, we believe that we will be able to show, particularly on the 11th and 12th, how this bridge works. And certainly, of course, we'd be happy to show you, this group, as well.

MR. HSIEH: Madame Chair, thank you.

Professors, first I want to extend my congratulations to your team's wonderful presentation. I think the view, potentially, looking from the drive, say, from the East will be just magnificent. It reminds me of the view that you stand in Paris at Champs Elysee, as you look toward the view to look at the Arch on both ends of Champs Elysee. I think this potentially would capture this kind of grandeur, once it is successful.

I do have a question. Your presentation shows that the bridge does have two levels, split levels, somewhat, it shows. Can you

point --

PROFESSOR BLACK: No, it's not. It is a one-level bridge.

MR. HSIEH: Does that offer flexibility in areas, let's say, such as bike lanes, a shoulder?

PROFESSOR BLACK: I should say that the size of the thing that we have in this presentation includes widths for the bike lanes and the width for the shoulders. The bike lane is very, very important to our team.

MR. HSIEH: And the third is, you talk about -- this was very early in your presentation. You talk about you would like to see -- you would like to bring in the cost of under one billion dollars.

Do you consider that as a reasonable estimation, or is it just a wild guess at this point?

PROFESSOR ASTANEH: It's a wild guess, but it's not very wild. The reasons are this. We can share with you some of the reasons why we believe that.

Our bridge -- first of all, our bridge will have bike lanes out on the sides. And I want to add that today, in coming here, and we have

(inaudible) from the UC Berkeley California magazine, and he mentioned that, if we are going to put bike lanes in the middle, he doesn't like it, just by looking at it.

I wouldn't feel comfortable biking inside a roadway, inside those cars. I look this way, and I see six lanes of cars passing 55 miles an hour. So our bike lanes will be on the side, looking into the water.

But as far as cost, our bridge is only 170 feet wide, which is the width you need for all these requirements that are established now: five lanes of roadway on the side, shoulders on each side, bike lanes on each side, and all the guardrail and other amenities that come with it. That is 170.

We have the single tower bridges, but they have the cars in the middle of the road, and the median. Those bridges, if you looked at the Chronicle front page, the one that was posted there had the tower in the middle. And that adds to the width of the bridge, and that makes your width 200 feet.

So because of the tower being in the median, you have your bridge 200 feet wide, not 170 feet wide. That adds to the cost almost 20 percent.

Our bridge, because it's curved, as soon as it comes out of the tunnel, it turns on the curve and it becomes parallel to the existing span almost about 200 yards the opposite way, going down parallel to the Oakland toll plaza.

We measured -- our bridge total length will be ten percent less than other options that we saw. Because the straight bridge, the bridge goes out in the middle of the bay, turns around and comes back to the toll plaza. And the length of our bridge is ten percent less than the length of any other option.

Having worked with steel for 25 years, I have established, of course, dimensions as roughly, as fast as we could over the last one and a half months, and we are confident that those are conservative numbers.

Looking at cost of steel that I know, and that's the main part -- the whole thing is steel bars, and we have some concrete some places. Our estimate is not very real wild guess, it's a back-of-envelope intuitive estimate we have made based on all these issues I mentioned to you, length being ten percent shorter.

And actually, Professor Black and I

did calculation of what that means in terms of waste of time and gas tank usage of the commuters on the bridge. It turned out to be 40 million dollars a year. Just shortening the numbers 10 percent, these 40 million dollar savings of the money that people spend using gas traveling that 10 percent extra. So it's about a quarter mile. So you can save quarter of a mile by using our proposal other than options.

To make it short -- I don't want to take the time up of the public comment. But our guess is that we are going to be able, hopefully, by May 12th -- it's a very tight schedule -- we will be able to come up with numbers that engineers can look at. We have the support of engineering, bridge engineering community. We have a company who is building right now two major steel bridges outside California, arch bridges and another bridge.

This company is specialized in building steel bridges. This company has the numbers of how much it cost to do something like this. We are going to work with them, until May 12th, to come up with numbers so that we can tell you that this is the number that they have told us that if you build this bridge, you can build it for this amount.

MR. HSIEH: Thank you.

MR. SIRACUSA: Gentlemen, obviously, aesthetics are in the eyes of the beholder. And I don't know how we're finally going to arbitrate what we think is the best looking design.

But second from that, is there anything inherently superior in your design, inherently superior in a seismic and engineering context, to the other three or four or five designs that we have seen so far?

PROFESSOR ASTANEH: Certainly, I will respond to that. Certainly, the most important component that we can assign to our bridge is that it's steel. That's very important. It's a steel bridge.

We have not had any major reinforced concrete cable-stay bridge in any seismic areas of the world, which are: Japan, Italy, and California. These three countries are the developed countries that have really high tech bridges and are the only countries that really can seriously compare to California.

What we have heard so far, they are concrete. And quite honestly, we have not seen a span of this length built using segmented concrete,

and tested in real earthquake, in any part of the world other than Europe. In Europe they have a lot of these bridges. In Germany -- the pattern started in Germany, cable-stay bridges.

The story is that after World War II, they had a lot of towers left, but the deck was dropped, so in a hurry they would just put the deck and cable them up to get the people moving. And that was the first cable-stay bridge. But in Germany, they have a lot of steel. But absolutely not seismic.

France has really spectacular bridge there, but it's still not seismic. Denmark has now very large population of cable-stay bridges, but most of them are concrete. There are a couple others. England has one very big one. These are all different than seismic areas.

So my response is that, inherently -- we know that in Kobe they have several cable-stay bridges. And I have actual slides, if you would like to view it. I'll show you slides of Kobe cable-stay bridges, how they performed in the seismic event.

Kobe is exactly like Oakland. Osaka is almost like San Francisco. Very, very similar.

In Kobe earthquake, those cable-stay bridges have almost no damage. In one case, the dam broke. And that was what Professor Black was referring to, that these modern gadgets -- we use them, fine. But you don't use them if they are not tested in major bridge.

You have to use technology, for major bridge, that is proven in real life. And we believe steel bridges have real-life testing here at home. We cannot bring these bridges into our laboratories and test them. When these bridges are tested internationally, we go to that laboratory. I call it "nature's lab." I spent two weeks in Kobe studying steel bridges. What I found was that they are absolutely superb performance, where some concrete bridges failed.

So my view is that, we do not put up in a highly seismic area, like this Bay Area here, a system that is not proved. We can do that in some little areas. We can build those things in Carquinez, we can build those things in other places, Sacramento. Let them be there. Let them be tested over the next 50 years. If we see that systems are longstanding bridges and perform, fine. Then you can put up the most important bridge in the

nation, using that system. But this is the most important bridge in the nation, 280,000 passengers.

I believe, personally, that we should not test our technology in this place. Let's build some concrete cable-stay bridges somewhere else. Let's test them. Because these bridges must last for over a hundred years.

PROFESSOR BLACK: The short answer to your question is: it's steel. It behaves structurally three-dimensionally instead of two-dimensionally. And the foundation is in solid and fascia rock, which doesn't transmit the seismic forces to the superstructure in quite the same -- as violently as other kinds of soil.

PROFESSOR ASTANEH: Just to give you some numbers --

CHAIRPERSON KING: Let me interrupt.

Mr. Siracusa is probably very familiar with design and engineering. Or he can talk to you after. But Ms. Brown has a question.

MS. BROWN: I think there is certainly elegance in simplicity. We have not decided yet on the issue of the bike lane. We haven't determined how the bike lane will tie in, or whether it's feasible or not. So when you do put together the

figures, will you be able to get the figures that show it with or without the bike line?

PROFESSOR BLACK: Yes.

PROFESSOR ASTANEH: Bike lanes aren't actually addressed in our speech today. But maybe next week, if we get a chance, we'll show you how bike lanes -- it's like -- a cross-section of our bridge is like a cross-section of the wing of an airplane. And you have seen airplanes break when the wings are flipping at the end of wing. Those are small flips that we have on your bridge, to be the bike lane. You can always eliminate those. It can just simply go on the main members, if you want to decide to put it. It's not going to change the main structure of the box of this bridge.

MS. BROWN: And is it going to add 150 million to the cost?

PROFESSOR ASTANEH: We are going to come up with numbers. We are working on numbers for the bike lane. And so we will be able, by May 12, to have some numbers that will also show -- if you add bike lane on one side and wheelchair access on the other side, how much is that going to cost.

MS. BROWN: To add 100 million dollars just for some bike lanes, it comes to around 16

dollars per bike for the cost of going halfway across the Bay Bridge, which is astronomical. So that's one thing we have to look at. Thank you.

CHAIRPERSON KING: Obviously, there has not been any conclusions with regard to what the bike lane cost is. We haven't got the figures set down yet. So keep working on the bike lanes.

MR. HSIEH: Madame Chair, just one point to the professors.

I think you just made an impressive presentation. You said that the span is ten percent less than other designs, which also represented the travel time. It not only represents cost reduction, but also travel time for the public, which is very significant.

CHAIRPERSON KING: Thank you for your work. We know we'll keep seeing you. We appreciate you.

PROFESSOR BLACK: If you include the lost time of high end lawyers and whatnot crossing the bridge, it will be an even higher number.

(Laughter.)

CHAIRPERSON KING: The next speaker is an engineer and professor, whose first and last name begins with S's. Obviously, he did not hear my

instruction, because I can't read the names.

STATEMENT BY CHENTUNG HSUE

PROFESSOR HSUE: I'm senior structural engineer and professor, Chentung Hsue, in the Contra Costa --

MR. MULLIGAN: Could you please spell your name for the transcript?

MR. HSIEH: Would you please spell your name in English? We want to have a record, so we know you have spoken.

MR. MULLIGAN: Do you have a business card with your name on it?

PROFESSOR HSUE: Pardon me?

MR. MULLIGAN: Do you have a business card with your name on it? Can you spell your name for the record?

PROFESSOR HSUE: I wrote a card. I did not bring my card.

MR. MULLIGAN: Okay. If you could spell your name into the microphone.

PROFESSOR HSUE: My name is H-s-u-e, the last name. First name is C-h-e-n-t-u-n-g.

MR. HSIEH: It's almost like my name,

Hsieh.

PROFESSOR HSUE: Yes.

I want to pay very special caution for the new option of the cable-stay bridge. I'm willing to support such options, but I want to emphasize two parts.

The first part is the linear seismic structural analysis of the horizontal different phases response of multi-supported long span structures due to seismic wave passage effect of strong earthquake excitations, such as the different phase displacement among bridge piers. It's especially important.

Second is the nonlinear seismic response analysis of cables stayed on the bridge. Due to high seismic excitation in vertical direction, some cables, being subject to compression, should be out of work at the same time, some cables being overstressed (owing to some cables withdrawing their work under compression) and being yield. At the moment, two nonlinear parameters are to take action, one is the physics nonlinear property, another is the geometrical nonlinear property.

Due to high seismic excitation, we

know the cable cannot be compressing. It only can take tension. So due to the earthquake excitation, some cables will have no action, some cables will be overstressed. So this should be taken into special consideration.

You know, in the United States we have 20-plus cable-stay bridges, all not in seismic regions. And also, in Europe and Asia there is a lot of cable-stay bridges that not in the seismic regions.

Now, San Francisco Bay Area is in a high seismic region, so we must show special caution for the structural analysis for new options of bridge, of eastern span of San Francisco/Oakland Bay Bridge.

Today, I want to state some other opinions. I see the skyway. Today I see, from the slide show, the concrete arch bridge. All of these options for the San Francisco/Oakland Bay Bridge east span, except the cable-stay bridge option, have to pay special caution on the linear seismic structural analysis.

They all have to pay special caution on the wave passage effect. That means the horizontal differential displacement of the

structure. The skyway and arch bridge should have special consideration in the analysis.

I am willing to support all new bridge design options for San Francisco/Oakland Bay Bridge east span, i.e., skyway, cable-stay bridge, concrete arch bridge, especially the new curved cable-stay for curved bridge, which is a very beautiful option.

But I just want to make this special mention. I have already, last meeting, in Oakland, gave a speech. Today, I also place great emphasis on this point. Thank you very much.

CHAIRPERSON KING: Thank you.

PROFESSOR HSUE: Next time, I will offer our new option, and also I will give you some more information regarding all the design options. We have a powerful tool, which can analyze the long span and supporting structures, which now has been set up in the advanced and top level in the world records. So next time, I will offer. Thank you.

CHAIRPERSON KING: Michael Brink.

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STATEMENT BY MICHAEL BRINK

MR. BRINK: Thank you again, very much. And my compliments to the professors. Very elegant, beautiful, and aesthetic design.

I gave a very preliminary version of this a couple weeks ago. And I've got this a little more straightened out, I think.

Historic structure, indeed. And this is the Eiffel Tower of the East Bay waterfronts we're talking about here, with better weather. If not the modern replacement, identical or at least similar in appearance to the original. Here is another approach.

Whatever hodgepodge or mishmash of design this may be considered, so is the Paris skyline, so is the San Francisco skyline in so many variations of type and degree. What do we have here? A never again, large, manmade, landfill island in the middle the bay connecting the San Francisco to the west by the greatest support tower suspension bridge in the world, but with only one very unsafe lane of vehicular access.

To the east of Yerba Buena, now beautifully lit art deco erector set necklace of the

formerly most functional double deck rail and auto causeway.

The proposal. Construct a new causeway, 10, 15 lane wide causeway north or south of the existing structure.

Two, remove the entire upper and lower decks of the old East Bay half of the Bay Bridge.

Three, take ultra light, open-air street cars from the East Bay, on the now single deck old bridge, to a more or less correctly restored 1939 Treasure Island. No roadway beneath the rails, only a couple of lanes of traffic. And from the outer railing inward on both sides, bench, sidewalk, skating and bicycle lanes. The old bridge could prove to be a quite saveable Atlantic City or Santa Monica pier-like light rail, pedestrian, roller skating and bicycle promenade extending from the East Bay waterfront all the way to Treasure Island.

San Francisco bound bicycle commuters from the East Bay could perhaps take Treasure Island/San Francisco ferries for the final leg, if access to the western spans of the Bay Bridge is impossible.

We had the embarcadero freeway for a double deck skate park for a couple of years, and only just sort of. But think of the potential here. Conversion and maintenance costs would, of course, be huge. But I think the potential for a reborn Treasure Island, with great public access, is enormous.

Four, in the middle is the original Treasure Island airfield, never constructed, a giant multi-use art deco stadium for your Giants, 49ers, Olympics, whatever. Sink it deep enough and they will come. Or maybe just music and picnics. Keeping open pedestrian, bicycle and light rail access throughout could in no possible way be seen to impede any other development.

And Maury St. Clair may have been the one who called it "one long onramp," but the person did have something in that there is elegance in simplicity also in the causeway.

I would be glad to answer any questions. I have copies of this most version of -- this week's version, if anybody would like it. Thank you.

CHAIRPERSON KING: Thank you.

Martin Tuttle.

STATEMENT BY MARTIN TUTTLE

MR. TUTTLE: I'm Marty Tuttle, from the Solano County Transporation Authority. I don't have an elegant design for you today. I regret, we don't have one ready. But I do want to comment on process, and maybe an elegant process.

Madame Chair and Commissioners, Solano County has an estimated 15,000 commuters a day that go over the Bay Bridge from home to work, trips during the weekdays. And there aren't many of them here today because they are probably stuck in traffic, getting back to home.

But as Commissioner Hsieh pointed out earlier, the Solano commuters would pay twice if the dollar bridge increase goes in effect on all Bay Area bridges. Solano commuters would pay twice. So I think from a design standpoint -- although we certainly appreciate the spirit of this debate -- from a Solano perspective, we want to make sure that the design comes down on the side of the cost effectiveness, and is really based on sound engineering criteria.

And furthermore, for safety purposes, we would think that the eastern span would have to

be replaced as soon as possible. Seems like only yesterday, but it was in 1989 that our famous Bay Bridge/World Series was disrupted. We really think it's time to move on with the project.

The Solano Transporation Authority has been working with the Contra Costa Transportation Authority, on a subcommittee, to accelerate the Carquinez Bridge project. We would hope that you would model your efforts in a way that we have, with a real spirit of cooperation with Caltrans and MTC. There is really a strong consensus to keep this thing on schedule. We would hope that this task force would stick to your aggressive schedule. You've got your design recommendation in July. That is aggressive, and we would salute you for that.

Further, we would want you to keep the option open of continuing this task force process further along so that, not only do you make a recommendation in a timely manner on the design, but more importantly, that you keep a broad base coalition in the Bay Area region of the best and brightest minds together through the actual construction process.

So thank you for coming to Solano

County. And I hope you enjoy your brief stay here.

CHAIRPERSON KING: Thank you very much. That's the last speaker. I want to thank you for your comments.

VOICE FROM THE AUDIENCE: Could I speak?

CHAIRPERSON KING: We need to have a card.

I want to make a response to the last speaker, Mr. Tuttle. We do intend to stay on schedule. And we appreciate that request that we do so. And we look forward to your reminding everybody else that we should, because we need that kind of emphasis. So that's well taken.

Next is Steve van Pelt.

STATEMENT BY STEVE VAN PELT

MR. VAN PELT: Thank you. I refer to myself as a transporation user. And there have some facts presented here today that I think are really, really important.

There was a chart for the new structure, which showed the rock dropping off rapidly on the east side of Yerba Buena Island. And that's my understanding of exactly how the bay is structured. The west side of the Bay Bridge rests

on solid rock. Right? On the East Bay, there are just footings that are resting on mud, essentially. The new proposal addresses that fact right at the point of Yerba Buena Island.

But I'm a little concerned, frankly, about things as they extend more towards the East Bay. And I know how difficult my printing is to read. But what I'm really suggesting is, maybe it's really appropriate to open up the basic requirements here. I see things starting at Yerba Buena Island, in the current tunnel, which they have to do. But there is no reason they have to end the same place that they do now on the East Bay. That span on the East Bay was built high to clear ships. But as far as I know, they have never had to traverse there because Treasure Island is in the way now. It was held at less than two percent grade so the old interurbans could climb it. Well, if we get rail back on the bridge someday, it's going to be able to climb a steeper grade than the interurbans.

What I'm suggesting is, you can certainly save a lot of money by making a bridge that immediately starts heading down. You would have to extend the causeway, but you could have less of a bridge. It would be steeper. And I'm just

suggesting that you don't necessarily have to end up at the same point that you did. I know when you were thinking of retrofit, that was a requirement. But I don't see that that is a requirement if we're talking about building a new bridge. So I think we need to open up our thinking just a little bit.

I would also like to suggest that we really need to think about the next 60 years. I had forgotten -- I tried to study these things. But the bridge cost 75 million dollars, and now it's worth two billion. I suspect two billion is not replacement cost. That's probably what 75 million is worth today. What I'm suggesting is, this is probably our one chance, for the next 60 years, to do these things right.

And looking at it in the future, I really, really hope that we're able to put a third deck on the bridge. And you scoff, I suspect. But realize, when they put the new decks on the Golden Gate Bridge, they lightened it up sufficiently that the existing cable structure could support an additional deck. I suspect those kinds of things will be happening to the Bay Bridge. I'm thinking of the western half of the bridge. And I'm just suggesting, if that is a possibility, then we need

to build the structures in the mud in the East Bay, to be able to support a third deck also.

I'm also aware that there have been some proposals to increase the band width across the bay. The Bay Bridge, after all, provided us with this opportunity. It really combined the Bay Area together. All right. I'm not suggesting that we want to be able to put more cars out there. But I am thinking that we probably need another rail crossing. And if we can't put it up on the bridge, it is possible to tunnel through rock as far as Yerba Buena Island. All right?

But it would only be possible to connect up the East Bay if we could then put a structure close to the water's edge, on the existing towers that we're going to build.

I'm just really trying to say, don't build us into a box. There really are some very unique problems on the east side, and it's called mud. And whereas I really applaud a lot of engineering work, because the latest designs I have seen realize this, and they solved the problem at Yerba Buena Island. But I am still concerned about the footings all right out in the mud. I think there needs to be a lot more work on that. Thank

you.

CHAIRPERSON KING: Thank you. Does MTC have any comments? Staff have any comments? (No response.)

Any comments from the Commission members?

MR. SPERING: I have just a few comments.

STATEMENT BY JAMES SPERING

MR. SPERING: I appreciate everyone that spoke this evening. This is the second hearing that I have attended. And just a few observations.

One is, I think it's important that the new span is aesthetically compatible to the other span. You know, all the pictures I see, it's always this single section. I would really like to see some rendition of the two sections together.

Another point is, I think there needs to be as much emphasis on the gateway to Oakland as the gateway to San Francisco. So from either direction, I think the bridge has to be very compatible to that gateway feature.

Another point I hope is addressed is

that the bridge needs to have a significant night-time profile. I really believe that, with very modest investment of lighting and traditional bridge features, that we can have a bridge and make it very attractive. And that's something that needs to be considered; what that bridge is going to look like at night time, and how it leads into Oakland and out of Oakland.

Another point is, any bike lanes, any special provisions for any special interest groups, should not be paid by the bridge tolls. New money should be brought to the table. I don't think that burden should be borne by the commuters and any of the counties. And I think those features are nice, but I would not like to see our residents from Solano County paying exorbitant bridge tolls from both the Carquinez and Bay Bridge just for additional features.

MR. HSIEH: Madame Chair, I do have one request. I would like to address it to the staff. The next session will be the hearing in San Francisco. I believe there will be some interest to see what is the access arrangements to the Yerba Buena Island and to the Treasure Island. I think that is going to be somewhat crucial to some of the

concerns from San Francisco. So I would like very very much to have some very brief presentation, if that is possible.

CHAIRPERSON KING: Thank you. As a follow-up to one of the issues that was raised at the last meeting, and certainly also a follow-up to comments made by Mr. Tuttle, I contacted -- it was about the length of time it takes to go through all of the environmental and permit processes.

I spoke with Congresswoman Taucher -- because, in fact, we have been able to get them to come to California as a result of the Northridge incident, but we still have federal hurdles. I spoke with Congresswoman Taucher and asked that she consider inserting into the new ICT legislation some provisions for this project, and she said she would consider that. And our staff is working with her staff. That was a follow-up to one request that was made last time.

With that, I want to thank you all for your attention. We look forward to working with you over the next couple months. And, hopefully, we'll get the best possible project with all of your input. Thank you very much.

(Ending time: 6:00 p.m.)

REPORTER'S CERTIFICATE

I, SHARON LANCASTER, CSR No. 5468, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and place therein set forth;

That the proceedings were recorded stenographically by me and were thereafter transcribed;

That the foregoing is a true and correct transcript of my shorthand notes so taken.

I further certify that I am not a relative or employee of any attorney or of any of the parties, nor financially interested in the action.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated this 27th day of April, 1997.

Sharon Lancaster

SHARON LANCASTER, C.S.R. No. 5468

REPORTER'S CERTIFICATION OF CERTIFIED COPY

I, SHARON LANCASTER, CSR No. 5468, a Certified Shorthand Reporter in the State of California, certify that the foregoing pages 1 through 54, constitute a true and correct copy of the original transcript of proceedings, taken on April 23, 1997.

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Sharon Lancaster

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